

Math

Cover, Copy, and Compare: Increasing Math Fluency

Appropriate Grade Level:

Elementary and middle school students working on basic math facts.

Brief Description:

Students learn a five-step procedure that gives them increased opportunities to respond to mathematics material and self-evaluate their responses. Cover, Copy, and Compare is an efficient strategy for increasing accuracy and speed in basic math facts, requires little student training or teaching time, and can be used with individuals, small groups, or entire classes.

Materials Needed:

- Training sheets of 10 math problems, with problems and answers listed down the left side of the paper, one per student, one to three sets per session
- Assessment sheets with the same math problems listed down the left side, without answers
- 3" by 5" index cards, one per student
- Stopwatch or watch with second hand for teacher (optional)
- Overhead projector and transparency example of training sheet (optional)

Procedure:

1. Evaluate how well students are currently doing by calculating percent correct scores on math worksheets for 5-10 days, counting the number of correct digits on problems, or administering Curriculum Based Mathematics Probes to the entire class or a selected group of students.
2. Give training sheets to students. If desired, use overhead projector displaying a transparency of a training sheet during the introductory session.
3. Conduct a training session:
 - a. Silently read the first problem and the answer on the left side of the paper.
 - b. Cover that problem and answer with an index card.
 - c. Write the problem and answer from memory on the right side of the page.
 - d. Uncover the problem and answer on the left side to check the written response.
 - e. Evaluate the response.
 - f. If the problem and answer are written incorrectly, repeat the procedure with that item before proceeding to the next item.
 - g. Repeat this procedure with the rest of the problems on the sheet.
4. After demonstrating these steps on the chalkboard or with the overhead projector, have students complete one or more training sheets and provide corrective feedback as needed.
5. Daily or several times a week, provide students with sets of training sheets and have them follow the Cover, Copy, and Compare procedure.
6. Once or twice a week, administer the assessment sheets that correspond to the training sheets. If desired, time these assessment sessions.
7. When students reach mastery level on one set of problems, provide them with another set. Mastery level is defined as 90% or better accuracy and/or 40 digits correct per minute.
8. Evaluate the effectiveness of the intervention by repeating the first step and comparing the results.

Comments/Tips:

This strategy works best for basic math facts in addition, subtraction, multiplication, and division.

Source:

Rathovan, Natalie (1999). Effective School Interventions. Guilford Press: New York, NY.

Resources:

Lee, M.J., & Tingstrom, D.H. (1994). A group math intervention: The modification of cover, copy, and compare for group application. Psychology in the Schools, 31, 133-145.

Skinner, C.H., Turco, T.L., Beatty, K.L., & Rasavage, C. (1989). Cover, copy, and compare: A method for increasing multiplication performance. School Psychology Review, 18, 412-420.

Improving Math Performance with Explicit Timing

Appropriate Grade Level:

Elementary and middle school students working on basic math facts.

Brief Description:

In order to increase fluency in basic math facts, math seatwork is timed in 30 minute intervals. Students will become more automatic in math facts and thus become more proficient in solving math problems. The use of explicit timing has been demonstrated to increase the rate of problems worked correctly while simultaneously maintaining very high levels of accuracy.

Materials Needed:

- Stopwatch or watch with second hand
- Kitchen timer with a bell
- Sets of math worksheets with 100 basic problems (addition, subtraction, etc.), with problems on one side only and sheets stapled together, one set per student per session

Procedure:

1. Assess the current math fluency of students by calculating the correct-problems-per-minute rate or accuracy scores on math worksheets for a selected group of students for 5 to 10 days.
2. At the beginning of a mathematics seatwork period, tell students that the work period is 30 minutes long (or the available number of minutes) and that you will be timing the period as a way of helping them improve their math performance.
3. Tell students that you will set the timer for the amount of time in the period, and that you will also be timing them with a stopwatch in 1-minute timings.
4. At the beginning of each timing, say: "Pencils up, ready, begin!" to signal students to begin working.
5. At the end of the 1-minute interval, say "Stop!" and have students draw a line after the last problem answered. Repeat this procedure throughout the 30-minute period until the last timing is completed.
6. When the 30-minute timer rings, announce that the work period is over. Teach students to stop when the timer rings, even if they are in the middle of a 1-minute timed period.
7. Evaluate the intervention by repeating the first step and comparing results.

Comments/Tips:

Because it is not possible to have 30 1-minute timings within a 30-minute period, the actual time available for students to work is always less than 30 minutes.

Source:

Rathovan, Natalie (1999). Effective School Interventions. Guilford Press: New York, NY.

Resources:

Van Houten, R., & Thompson, C. (1976). The effects of explicit timing on math performance. Journal of Applied Behavior Analysis, 9, 227-230.

Reciprocal Peer Tutoring to Improve Math Achievement

Appropriate Grade Level:

Elementary and Middle school

Brief Description:

The purpose of this intervention is to improve math performance and behavior during math instruction by means of peer tutoring, group rewards, and self-management procedures.

Students monitor their academic progress in a group context, acting as instructional partners for each other, setting team goals, and managing their own group reward contingencies. Reciprocal peer tutoring has been demonstrated to improve not only math performance but also students' perceptions of their own academic competence and self-control, and earns high satisfaction ratings from both teachers and students. The intervention takes approximately 30 minutes – 20 minutes for peer tutoring and 10 minutes for individual class drills and checking.

Materials Needed:

- Reinforcement Menus with activity rewards, one per student pair
- "Team Score Cards," consisting of 3" by 5" index cards or sheets of paper, one per student pair per week
- Stickers for team score cards
- Flash cards with math problems printed on the front and the problem plus computational steps and answers printed on the back, one problem per card, one set of cards per student pair
- Sheets of paper divided into four sections: "try 1," "try 2," "help," "try 3"
- Instructional prompt cards or sheets with specific instructions related to common mistakes in solving math problems, one per student pair
- Problem drill sheets with 10 or more problems, one per student per session
- Answer sheets for problem drill sheets, one per student per session (optional)

Procedure:

1. Assess students' current level of math performance by calculating percent-correct scores on daily math drill sheets or weekly quizzes, administering Curriculum-Based Math Probes, and/or observing students' behavior during math work periods.
2. Tell the students that they will be learning to work in teams to help each other do well in math.
3. Divide the class into pairs. Provide each pair with a Reinforcement Menu listing activity rewards. Help each pair select a reward for the day.
4. Meet weekly with each team to help the students select their team goal.
5. After each pair has chosen a team goal, have the pairs record their expected individual contribution to the team (individual goals), the sum of the individual goals (team goal), and their choice of a reward on the team score card.
6. Give a set of flash cards to each pair, and tell the students to choose who will act as "teacher" first.
7. Have the "teachers" hold up the flash cards for the students, and tell the students to work the problem on their worksheets in the section marked "try 1" while their teachers observe their work.

8. If the problem is solved correctly, the teachers praise the students and present the next problem. If the solution is incorrect, the teachers give students instructional prompts read from a prompt card and tell them to try again in the worksheet section marked "try 2."
9. If the students do not solve the problem correctly on the second try, teachers help them by computing the problem in the "help" section of the worksheet. As teachers work the problem, they explain what they are doing at each step and answer students' questions. Then the teachers tell the students to work the problem again in the "try 3" section. If teachers have trouble answering students' questions, they can ask the classroom teacher for help.
10. After 10 minutes, signal the pairs to switch roles for a second 10-minute tutoring session.
11. During tutoring sessions, walk around the room supervising and identifying strategies "teachers" can use to help their students.
12. After the second tutoring session, give each student a problem drill sheet and have students work on their own for a fixed period of time, such as 7 to 10 minutes.
13. Have students switch papers with their team partner. Have them use an answer sheet to correct their partner's work or provide the correct answers yourself as students check papers.
14. Have the pairs first determine their team's total score by counting the number correct, and then have them compare their team score with their team goal to see if they have "won" (met their goal).
15. If a team wins, give the students a sticker to put on their score card for that day. After five wins, schedule a time when the team can engage in the previously selected reward activity.
16. Evaluate the intervention by repeating the first step and comparing results.

Comments/Tips:

Rewards can also be provided on a weekly classwide basis rather than on a daily team basis when a pre-determined percentage of teams meet their goals 4 out of 5 days during the week. Deliver the rewards to the entire class on Friday.

Source:

Rathovan, Natalie (1999). Effective School Interventions. Guilford Press: New York, NY.

Resources:

Fantuzzo, J.W., King, J.A., & Heller, L.R. (1992). Effects of reciprocal peer tutoring on mathematics and school adjustment: A component analysis. Journal of Educational Psychology, 84, 331-339.

Fantuzzo, J.W., & Rohrbeck, C.A. (1992). Self-managed groups: Fitting self-management approaches into classroom systems. School Psychology Review, 21, 255-263.

Solving Word Problems Using Structured Organizers

Appropriate Grade Level:

Elementary and Middle School

Brief Description:

This intervention gives students better understanding of reading, interpreting, and solving word problems in mathematics. The use of structure organizers is first modeled by the teacher, students use the organizers on their own, and is phased out as students become more proficient.

Materials Needed:

- Structured Organizers for solving math word problems
- Transparency of structured organizer

Procedure:

Phase 1: Modeling the use of Structured Organizers

1. Display a word problem and a structured organizer to the entire class on the overhead projector. Hand out copies to the students. Have students complete their own copies as you call on individual students for responses and fill in the transparency.
2. Have students hand in their structured organizers and answer the word problem.

Phase 2: Checking student use of Structured Organizers

1. Have the students independently fill out the organizer for a new word problem.
2. Come back together as a whole class and fill out the organizer together, calling on students to answer the questions. Record responses on the organizer transparency and have students make any necessary corrections on their papers.

Phase 3: Independent Use of Structured Organizers

1. Give students new word problems and have them complete structured organizers while solving them. Do not have them respond as a group.

Phase 4: Maintenance

1. Have students complete word problems without giving them structured organizers to complete.

Comments/Tips:

This intervention uses elements of the Group Story Mapping intervention for reading comprehension. Structured Organizers can be found in Lerner (2003) and Bos & Vaughn (2002), referenced below.

Sources:

Bos, C.S., & Vaughn, S. (2002). Strategies for Teaching Students with Learning and Behavior Problems, 5th Edition. Boston: Allyn and Bacon.

Lerner, J. (2003). Learning Disabilities, 9th Edition. Boston: Houghton Mifflin Company.

Rathovan, Natalie (1999). Effective School Interventions. Guilford Press: New York, NY.

Sequence for Teaching Fractional Concepts

Appropriate Grade Level:

Elementary and Middle School

Brief Description:

Suggestions for the progression in working with students on fractions and understanding concepts behind fractions.

Materials Needed:

- Fractional Models and Manipulatives
- Graph Paper

Procedure:

The student

1. Manipulates concrete models (e.g., manipulating fractional blocks and pegs)
2. Matches fractional models (e.g., matching halves, thirds, and fourths)
3. Points to fractional model when name is stated by another (e.g., the teacher says "half" and the student selects a model of "half" from several distractors)
4. Names fractional units when selected by another
5. Draws diagrams or uses manipulatives to represent fractional units
6. Writes fraction names when given fractional drawings
7. Uses fractions to solve problems

Sources:

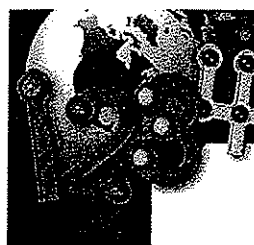
Bos, C.S., & Vaughn, S. (2002). Strategies for Teaching Students with Learning and Behavior Problems, 5th Edition. Boston: Allyn and Bacon.

SEARCH

LOGIN
REGISTER

October 13, 2008

VIEW CART



INNOVATIVE LEARNING CONCEPTS INC.

The Alphabet of Mathematics® Since 1975

ABOUT
TOUCHMATHGENERAL
INFO

PRODUCTS

FREE/SALE
ITEMSSIGN UP
CATALOG
E-FLASH

TRAINING



PUTTING ANSWERS WITHIN REACH

MATH MASTERY FOR GRADES PRE-K, KINDERGARTEN, FIRST, SECOND, THIRD AND SPECIAL EDUCATION.

TouchMath is a multisensory program that uses its signature TouchPoints to engage students of all abilities and learning styles.

Our award-winning, step-by-step approach covers: Counting • Addition • Subtraction • Place Value • Multiplication • Division • Time • Money • Fractions • Story Problems • Shapes • Sizes • Pre-algebra

TouchMath has been proven to raise math test scores in classrooms around the world for over three decades. Use this intuitive system as a supplement to any curriculum or as a stand-alone program. It's easy to teach and easy to learn!

GRADE
LEVELS

LEARNING
DIFFERENCES

PROGRAMS

SEMINARS

PARENTS

UNIVERSITY

EXPRESS
SHOPPING

FREE MATERIALS

PRODUCTS

MONTHLY WEB SPECIAL

FREE TEACHER TRAINING


☒ FREE DVD/VIDEO


Innovative Learning Concepts Inc.
6760 Corporate Drive, Colorado Springs, CO 80919 • 1-800-888-9191 • Fax 719-593-2446
TouchMath is a Federally Registered Trademark • Copyright © 2000 - 2008 Innovative Learning Concepts Inc.

ABOUT TOUCHMATH • PRODUCTS • E-NEWS REQUEST • CATALOG REQUEST • CONTACT US